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introducing a primary flow of reactants into the chamber in a manner whirling around said longitudinal axis, and

withdrawing reaction products at an opposite end of the reaction chamber in a flow along the longitudinal axis,

whereby said primary flow and said flow reaction products approximate a free vortex flow characterized by a negative pressure gradient increasing towards said axis, and

introducing at the periphery of said surface a secondary protecting flow directed towards the central area of the surface, enabling thereby said pressure gradient created by said vortex flow to keep said secondary flow non-separated from said surface substantially over its entire area.

19. (new) A method according to claim 18, wherein said secondary flow is introduced in the chamber at a flow rate lower than that of the primary flow.

20. (new) A method according to claim 18 or 19, wherein said secondary flow is free of any said reactants of the primary flow.

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21. (new) A method according to claim 18 or 19, wherein said primary flow comprises a working fluid and said secondary flow is free of said working fluid.

22. (new) A method according to claim 18 or 19, whereby said secondary flow is used to cool said surface.

23. (new) A method according to claim 18 or 19, whereby said primary flow is introduced into the chamber as a conical whirling jet flowing away from said surface.

24. (new) A method according to claim 18 or 19, whereby said primary flow is introduced into the chamber along an interior wall thereof.

25. (new) A method according to claim 18 or 19, whereby radiation absorbing particles are introduced into the chamber in order to elevate said primary flow's temperature and thereby initiate the reaction.

26. (new) A method according to claim 18 or 19, wherein said secondary flow is an inert fluid.

27. (new) A method according to claim 19, wherein the rate of said secondary flow is essentially lower than the rate of said primary flow.

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28. (new) A method according to claim 27, wherein the rate of the secondary flow is only a few percent of the rate of the primary flow.

29. (new) A reaction chamber having a longitudinal axis and a surface to be protected disposed at one end of the chamber and oriented substantially transversely to said longitudinal axis,

said surface having a central area close to said axis and a periphery remote from said axis,

a primary ingress means for introducing a primary flow of reactants into the chamber in a manner whirling around said longitudinal axis,

an egress opening disposed at an opposite end of the chamber for withdrawing reaction products from the chamber in a flow along the longitudinal axis, whereby said primary flow and said flow of reaction products approximate a free vortex flow characterized by a negative pressure gradient increasing towards said axis, and

a second ingress means for introducing at the periphery of said surface a secondary protecting flow and directing it towards the central area of the surface, whereby said pressure gradient created by the vortex flow keeps said secondary flow non-separated from said surface substantially over its entire area.

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30. (new) A reaction chamber according to claim 29, wherein the longitudinal axis passes through said egress opening.

31. (new) A reaction chamber according to claim 29 or 30, wherein the surface to be protected is free of any fluid inlets formed therein.

32. (new) A reaction chamber according to claim 31, wherein the surface to be protected is a transparent window adapted for admitting incident concentrated solar radiation.

33. (new) A reaction chamber according to claim 32, capable of being associated with a solar radiation concentrator via said transparent window.

34. (new) A reaction chamber according to claim 32, wherein said reaction chamber is shaped to approximate a black body radiation cavity.

35. (new) A reaction chamber according to claim 29 or 30, wherein said chamber has walls that are capable of being heated up, and said primary ingress means are arranged so that said primary flow acts to extract heat from said walls prior to being introduced into said chamber.